

DERWENT-ACC-NO: 2003-441297

DERWENT-WEEK: 200341

COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Manufacture of patterns on
photomasks or reticles used
for the fabrication of semiconductor
devices e.g. MRAM or DRAM, uses elliptical shaped laser or
electron beam to form the pattern

INVENTOR: CARPI, E L ; CARPI, E

PATENT-ASSIGNEE: CARPI E L [CARPI] , INFINEON TECHNOLOGIES
AG [INFN]

PRIORITY-DATA: 2001US-0032389 (October 26, 2001)

PATENT-FAMILY:

PUB-NO	PAGES	PUB-DATE	MAIN-IPC
US 20030082461 A1	000	May 1, 2003	G03F 009/00
WO 2003036386 A2	019	May 1, 2003	G03F 001/14

DESIGNATED-STATES: CN JP KR AT BE BG CH CY CZ DE DK EE ES
FI FR GB GR IE IT LU
MC NL PT SE SK TR

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-DESCRIPTOR	APPL-NO
US20030082461A1		N/A	
2001US-0032389		October 26, 2001	
WQ2003036386A2		N/A	
2002WO-EP11951		October 25, 2002	

INT-CL (IPC): G03C005/00, G03F001/14 , G03F009/00

ABSTRACTED-PUB-NO: WO2003036386A

BASIC-ABSTRACT:

NOVELTY - Photomask manufacture method, includes a mask (316) with elliptical (34) or rounded features formed using an elliptical shaped laser on electron beam (350) to form a pattern including an oval or rounded feature on the mask. Portions of the oval or rounded stair shaped features on the mask are removed. The oval or rounded feature stair-shaped edges (344) are removed also with the energy beam. The mask is used to pattern a semiconductor wafer which comprises a magnetic random access memory (MRAM) or dynamic random access memory (DRAM) device.

DETAILED DESCRIPTION - INDEPENDENT CLAIMs are included for;

- (1) a method of fabricating a mask for patterning a semiconductor device,
- (2) a method of fabricating a semiconductor device,
- (3) a semiconductor device patterned using the above method,
- (4) and a method of patterning a semiconductor wafer.

USE - For use in obtaining elliptical and rounded shapes using laser/electron beam shaping

ADVANTAGE - Provides a method of creating oval and rounded features on a semiconductor device mask that are absent the stair step edges resulting from laser/electron beam patterning using a beam having a circular cross section. Memory devices such as MRAM and DRAM devices particularly benefit from the ability to create elliptical shapes and patterns, maximizing memory cell performance. Furthermore, smoothing edges of oval and

rounded features with an
elliptical-shaped laser-electron beam is faster, requires a
lower power
density, and patterns a larger surface area than using a
circular cross
sectional energy-beam, and in prior processes.

DESCRIPTION OF DRAWING(S) - The drawing figure shows an
elliptical
laser/electron beam being used in the mask process.

Mask 316

Elliptical or rounded features 340

Stair shaped edges 344

Elliptical shaped laser on electron beam 350

CHOSEN-DRAWING: Dwg.4/6

TITLE-TERMS: MANUFACTURE PATTERN PHOTOMASK RETICLE
FABRICATE SEMICONDUCTOR
DEVICE DRAM ELLIPSE SHAPE LASER ELECTRON BEAM
FORM PATTERN

DERWENT-CLASS: P83 P84 U11 U14

EPI-CODES: U11-C04A; U11-C04D; U11-C04E1; U11-C04E2;
U11-C04F1; U11-C04F2;
U14-A03B4; U14-A04A;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2003-352291